

## Sample Action Plan for Unhealthy Air Quality

**Purpose of the Plan:** The (*district name*) Unified School District acknowledges the potentially adverse effects of unhealthy air quality on the health of students and employees. It is the purpose of this Plan to: (1) establish a communications protocol from the local air quality management district to the school district and school sites and to students and employees; (2) identify action levels based on State regulations and federal air quality index (AQI) levels reported by the air district; and (3) provide guidance for reducing student exposures to unhealthy air.

### Notification of Unhealthy Air Quality

**Receipt of air district information:** It is the responsibility of the Superintendent of the (*district name*) USD, or his or her designee to monitor air quality information available from the local air district on a daily basis. The prior day's 24-hr forecast for each school site in the district shall be verified on the morning of the effective date by viewing the air district's Web page at (*insert hyper link or appropriate Web page*), or by calling the district's hot line at (*insert area code and phone number*). The (*district name*) USD will also subscribe to the (*name of local AQMD*) air district's automated e-mail notification system for air quality alerts and Spare-the-Air announcements. The (*district name*) USD will provide the (*name of local AQMD*) air district with phone and facsimile numbers for receipt of State-required Health Advisory Notices and smog episode notifications.

**Transmitting air quality information:** The (*name of district*) USD shall determine when to notify the schools and employees that actions should be taken to reduce exposures to unhealthy air. The district superintendent will notify principals, or their designees at affected school sites by telephone, facsimile and e-mail to ensure that the message is received. In turn, principals or their designees shall disseminate by telephone, facsimile, and e-mail the air quality information, relevant parts of this Action Plan, and guidance for outdoor activities to teachers and coaches. Color-coded flags or pennants may be used as visual alerts to changing air quality.

**School site responsibilities:** Upon notification by the (*name of district*) USD, school sites should confirm that they are located in the geographical area of the current or forecast unhealthy air quality by viewing the air district's Web page and confirm the valid time for the air quality alert or notification. School sites should implement the school district's policies and procedures for reducing children's and employees' exposures.

### Unhealthy Air Quality

There are two air quality programs that can affect outdoor activities at schools. The first is the Smog Episode notification program mandated in the State's Air Pollution Emergency Plan. The second is an Air Quality Index (AQI) alerting program developed for the driving public by the local air districts. Under the latter program,

four of the larger air districts provide Spare-the-Air public service announcements to encourage reduced vehicle use on unhealthy air quality days. The (*if applicable, insert name of local AQMD*) Air District also provides e-mail notification of poor air quality to individual subscribers through its list server at (*if applicable, insert hyper link to list server*).

### **Actions and Cautionary Health Messages Under Federal Air Quality Categories**

The AQIs for ozone are typically based on the average of eight 1-hour field measurements or computer-modeled predictions compared to the national 8-hr standard. The AQIs for fine particulates (PM<sub>2.5</sub>) are based on the average of twenty-four 1-hour measurements compared to the 24-hr average federal air quality standard. There have been times when both the 8-hr ozone and 24-hr PM AQIs were based on fewer measurements in order to portray current conditions. The cautionary health messages that accompany the AQI categories below are based on the duration of a person's exposure being similar to the averaging times. Currently, there are no composite AQIs representing two or more pollutants or composite cautionary health messages for the cumulative effects of two or more pollutants.

US EPA's five categories of AQI for ozone and particulate material (PM):

<u>AQI</u>	<u>Descriptor</u>	<u>Health Cautionary Messages</u>
0 – 50	Good air quality (green flag)	No health impacts expected
51 – 100	Moderate air quality (yellow flag)	<u>Ozone:</u> <i>Unusually*</i> sensitive people should consider limiting prolonged outdoor exertion; <u>Particulate matter:</u> <i>Unusually*</i> sensitive people should consider reducing <i>prolonged*</i> or heavy exertion.
101 – 150	Unhealthy for Sensitive Groups (orange flag)	<u>Ozone:</u> Active children and adults, and people with respiratory disease, such as asthma, should <i>limit*</i> prolonged or heavy outdoor exertion; <u>Particulate matter:</u> People with respiratory or heart disease, the elderly and children should reduce prolonged or <i>heavy exertion*</i> .
151 – 200	Unhealthy (red flag)	<u>Ozone:</u> Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged or heavy outdoor exertion;

everyone else, especially children, should limit prolonged outdoor exertion;

Particulate matter:

People with respiratory or heart disease, older adults, and children should avoid prolonged exertion, everyone else should limit prolonged exertion.

201 – 300      Very Unhealthy  
(purple flag)

Ozone:

Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion;

Particulate matter:

People with heart disease, older adults, and children should avoid all physical activity outdoors; everyone else should avoid prolonged or heavy exertion.

As used above, the following terms can be generally defined as:

*“unusually sensitive people”* – typically, these people know who they are and are likely to have physical limitations and/or medical conditions that cause them to be more sensitive to air pollutants.

*“prolonged”* - U.S. EPA defines as 4 hours or more

*“limit”* - shorten duration or reduce intensity

*“moderate exertion”* – breathing rate 25 to 45 liters per minute

*“heavy exertion”* – breathing rate greater than 45 liters per minute

When the 8-hour ozone AQI exceeds, or is predicted to exceed 211, the State’s Health Advisory Notice would take precedent over federal recommended actions.

### **Actions Under State Emergency Air Pollution Plan Smog Episodes (Ozone)**

- Health Advisory Episode (stage) – Occurs when ozone reaches, or is predicted to reach 0.15 ppm for one hour or more. Equivalent 1-hr AQI  $\geq 132$  (unhealthy for sensitive groups), or 8-hr AQI  $\geq 211$  (very unhealthy)

Action: “sustained (outdoor) rigorous exercise for more than one hour by students must be discontinued.”

- Stage 1 Episode – Declared when ozone reaches 0.20 ppm or greater for one hour or more. Equivalent 1-hr AQI  $\geq 201$  (very unhealthy), or 8-hr AQI  $\geq 231$  (very unhealthy).

Action: Same as Health Advisory stage but includes warnings for “sensitive persons, persons with chronic lung disease or asthma, the elderly, the chronically ill, and exercising adults and children . . . should: avoid strenuous outdoor physical activity . . . during the episode . . . plan other diverting indoor activity for children and adolescents.”

- Stage 2 Episode – Declared when ozone reaches 0.35 ppm or greater for one hour or more. Equivalent 1-hr AQI  $\geq 273$  (very unhealthy to hazardous), or 8-hr AQI  $\geq 290$  (very unhealthy to hazardous)

Action: Air districts issue health warnings to sensitive persons and those displaying reaction symptoms. Public parks and public recreational facilities are to suspend programs that involve physical exertion, except for scheduled adult athletic events with paid attendance. Children should be kept indoors.

- Stage 3 Episode – Declared when ozone reaches 0.50 ppm or greater for one hour or more. Equivalent to 1-hr AQI  $\geq 396$  (hazardous), or 8-hr AQI  $>> 300$  (hazardous)

Action: “Remain indoors until the episode is terminated. Keep doors and windows closed, if possible. Use air conditioner to recirculate indoor air and keep cool.”

Stage 2 and 3 Smog Episodes for ozone have been relatively rare.

### **Specific Considerations and Actions to Reduce Exposures**

When air quality is determined by the air district to be “unhealthy for sensitive groups” (AQI = 101 to 150), special consideration shall be given to those who would have trouble breathing or show other health symptoms resulting from outdoor activities. Children with asthma action plans developed in conjunction with their physician, parents, and school nurse should follow their plan. (Responsible person or office) shall ensure that space indoors is available for children with asthma or other respiratory diseases; such children should be allowed to remain indoors if they request to do so. Sensitive children who remain outdoors should reduce the intensity of their activities commensurate with the increase in the AQI. Breathing rates for sensitive groups should not exceed the normal resting (walking) rate as the AQI nears 150.

**Options for Physical Education Classes and Recesses on High Ozone Days** are provided in attachment #1.

**Options for Physical Education Classes and Recess on High Ozone Days**

It is important to remember that ozone affects each child differently. Children with asthma or other respiratory diseases are more susceptible to the health effects that can be triggered by ozone. Each child may show symptoms at different levels of ozone. Therefore, the best way to monitor activities during times of elevated exposure to ozone is to ask children to report any symptoms related to difficulty in breathing to school staff (teacher, nurse, coach). If a child is particularly affected by ozone, or has been in the past, take steps to ensure their exposure or activity level is reduced to decrease the chance of symptoms. Alternatively, children could be moved indoors for continued exercise (indoor environments can have 20 to 80% less ozone). Children with asthma should have an asthma management plan on file at their school so that symptoms can be treated immediately and appropriately.

The cautionary health statements and recommendations that follow relate to 8-hr ozone AQIs reported on Spare-the-Air days. Outdoor activities of shorter duration (e.g., 15-minute recess or 1-hour physical education class) would not require the same restrictive measures because the exposures would be less. If ozone is accompanied by elevated levels of fine particulate material (PM<sub>2.5</sub>), it is recommended that schools also review the cautionary health statements for this pollutant that are available on US EPA's Web page ([http://www.epa.gov/airnow/aqi/aqi\\_conc\\_calc.html](http://www.epa.gov/airnow/aqi/aqi_conc_calc.html)).

**50 to 100 is “moderate” air quality (yellow days)**

US EPA recommends that *unusually sensitive people should consider limiting prolonged outdoor exertion.*

(California is considering revising the State's 8-hour ozone standard to a level that would fall within this AQI range.)

**101 to 150 is “unhealthy for sensitive groups” (orange days)**

U.S. EPA recommends that *active children and those with respiratory disease, such as asthma, should limit prolonged outdoor exertion.*

Limit outdoor physical activities to less than one hour (e.g., split time between morning and afternoon). Indoor activities should be made available to children with respiratory disease, such as asthma.

**151 to 200 is “unhealthy” (red days)**

US EPA recommends that *active children and those with respiratory disease such as asthma should avoid prolonged outdoor exertion.*

Healthy children should reduce the intensity of outdoor activities lasting an hour or more. Children with asthma or respiratory disease should reduce the intensity and duration of any outdoor activities and be given the opportunity to continue their activities indoors.

**200 and greater is “very unhealthy” (purple days).** (This is also the “Health Advisory Stage” for smog alerts under the State's Air Pollution Emergency Plan rules. Schools should be directly notified by air districts when ozone reaches or is predicted to reach this level for one hour or more.)

U.S. EPA recommends *active children and those with asthma should avoid all outdoor exertion*. The State's Emergency Plan requires that *sustained rigorous outdoor exercise for more than one hour must be discontinued*. Therefore, move physical activities inside where possible.

High ozone days are often bright and warm sunshine days. It is always recommended that school staff *watch children carefully for signs of distress and ensure ready access to medications for kids with asthma*.

### **Options for outdoor physical activities**

What would normally be safe for eight hours of exposure ("safe" means not likely to result in adverse health effects in the general population") becomes less so with increased breathing rates and the duration of exposures. Therefore, a risk reduction strategy involves reducing intensity (breathing rates) and duration (time) of vigorous outdoor activities.

Possible ways to reduce risks from exposures to ozone:

- 1) Reduce intensity of the activities:
  - a. Switch out players more often during practice and games
  - b. Focus on skill development versus endurance training
  - c. Alternate endurance activities with skills development
  - d. Take frequent rest and water breaks
- 2) Spend part of practice indoors and part outdoors
- 3) Split practice into two parts: one before and one after school
- 4) During weeks or months of high ozone, move practices to before school
- 5) Shorten the length of practices
- 6) Move inside when practical

Examples of activities that are of relatively low-to-moderate intensity include: diving, walking, gymnastics, wrestling, golf, karate, isometrics (stretching exercises), baseball, boxing, tetherball, four-square, horseback riding; non-competitive swimming, tennis, cycling, and volleyball.

Examples of activities of high intensity that result in sustained aerobic activity: long-distance running, competitive cycling, basketball, soccer, rugby, ice hockey, ice skating, and cross-country skiing. Each of these involves some form of running.

Physical education instructors are encouraged to develop lesson plans that include options for reduced intensity and duration of outdoor activities on poor air quality days. Coaches of competitive sports should consider training (a situation when aerobic activity can be greater than the sports event itself) during times of the day when air quality is better (typically morning hours).